

REMARKS

Claims 1 and 3-27 are pending in the present application. The rejections under 35 U.S.C. 102 and 35 U.S.C. 103 are respectfully traversed. However, in order to further the prosecution of this application, the independent claims and some of the dependent claims have been amended in order to further distinguish them from the cited art. Support for the claim amendments can be found in the specification and drawings, in particular in paragraphs 0014, 0043, 0053, 0057-0058 of US2005/0002324 (published version of the present application). No new matter has been added. Applicants believe that the present application as amended is now in condition for allowance of which prompt and favorable action is respectfully requested.

By this amendment, some of the dependent claims have also been amended to cure informalities and other typographical errors noticed by the Applicants. And, other claims were amended to preserve consistencies.

35 U.S. C. 102 Rejection

Claims 1, 3-8, 12-27 were rejected under 35 U.S.C. 102(e) as being anticipated by Narasimhan (US 7,016,651). Applicants respectfully traverse this rejection for the reasons stated below. The MPEP recited the standard to be applied in an issue of anticipation under 35 USC 102. Section 2131 of the MPEP states in part:

TO ANTICIPATE A CLAIM, THE REFERENCE MUST TEACH EVERY ELEMENT OF THE CLAIM

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)."

“The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). *See also* MPEP § 2131.”

As pointed out by Applicants in the previous Response, Applicants respectfully disagree with the assertion that Narasimhan teaches the claim element of detecting or determining received power in an unassigned sub-carrier frequency band. To further prosecution of the pending claims, Applicants have amended the claims to recite the element of “detecting a received power in an idle sub-carrier frequency band, wherein the idle sub-carrier frequency band includes only noise and interference” in claim 1; the element of “determining an idle sub-carrier frequency band during the symbol period, wherein the idle sub-carrier frequency band includes only noise and interference” in claims 14 and 27; the element of “to determine an idle sub-carrier frequency band during the OFDM symbol period wherein the idle sub-carrier frequency band includes only noise and interference” in claim 15; and the element of “determining an idle sub-carrier frequency band during the OFDM symbol period wherein the idle sub-carrier frequency band includes only noise and interference” in claim 21.

Support for the claim element of an idle sub-carrier frequency band is found paragraphs 0014, 0043, 0053, 0057-0058 of US2005/0002324 (published version of the present application). In particular, paragraph 0058 defines the idle sub-carrier to include only noise and interference as recited in the pending claims.

In contrast, Narasimhan teaches “techniques employ a link interface receiving OFDM symbol(s) from the link, and a signal-to-noise ratio (SNR) estimation unit generating an estimate of a geometric SNR (SNR_{geo}) for the received symbols based on an average of the logarithmic difference between soft decision and hard decisions for the

received symbol.” *Narasimhan (US 7,016,651), Abstract*. As discussed in several instances in the Office Action, for example on pages 3 and 5, *Narasimhan* in the abstract teaches “determining SNR determines power of unassigned sub-carrier” and “performing SNR estimate”. The Office Action on pages 7-8 also cites to *Narasimhan* Col 3, lines 31-48 and Col 8, lines 17-47, respectively, for teaching the above-mentioned elements.

In particular, *Narasimhan* in Col 3, lines 31-48 states:

“The RF receiver unit 115 performs routine downconversion and automatic gain control of these inbound RF signals, and presents an analog baseband signal containing at least one frame of 802.11a/g OFDM symbols to the receive baseband processor 120. Generally speaking, the receive baseband processor 120 performs symbol demodulation of the each inbound 802.11a/g compliant frame to recover bitstream data for receiver synchronization (preamble), frame or packet definition (header), or the actual inbound data of interest (payload). As will be described in more detail below with reference to FIGS. 2 and 3, the receive baseband processor 120 includes a geometric signal-to-noise ratio (SNR_{geo}) estimation unit 235 to measure signal quality and provide a signal quality parameter (SQ) to the MAC layer controller 128 of the MAC interface 125, a type of network interface bridging the OSI layer 1 PHY transceiver with higher layer (OSI 2+) networks and applications serviced by the transceiver.”

In particular, *Narasimhan* in Col 8, lines 17-47 states:

“For example, assume in an 802.11a/g OFDM system, a subset of sub-carriers are selected from a set of sub-carriers. If $K=8$, meaning that a subset of 8 sub-carriers are used to estimate $SNR_{geo,n}$, a possible regularly spaced subset could include sub-carriers {1, 8, 15, 22, 29, 36, 43, 50} for the n th OFDM symbol in the received frame. Thus, in this case, every 7th sub-carrier is selected for averaging. For the next OFDM symbol $n+1$, this subset could remain the same, or alternatively, a different subset, partially or fully distinct from the previous subset, may be selected, such as {2, 9, 16, 23, 30, 37, 44, 51}. Of course, this represents only a possible selection strategy to achieve an acceptable SNR_{geo} estimate, either in isolation or over a number of received OFDM symbols or frames, and in fact other selection strategies may be implemented consistent with the present invention as long as a sufficient number of sub-carriers are chosen to provide a representative subset of the symbol constellation. With consideration given to such sub-carrier subset selection, equation (8) becomes:

$$SNR_{geo,n,dB} \approx \text{Avg} \left[-20 \log_{10} \left| \frac{Y_{n,k}}{H'_{n,k}} - K_{mod} D_{n,k} \right| \right],$$

$k = K_0, K_1, \dots, K_{K-1}, K :: N.$

This relationship can be conveniently implemented by the SNR estimation unit 235 shown in FIG. 2 to provide an SNR estimate, and consequently a measure of signal quality 5Q on a per received OFDM symbol basis."

As shown in the quotes, what Narasimhan teaches is SNR, that is, signal-to-noise ratio. In Narasimhan, the component of a "signal" is present in the "unassigned" sub-carrier. This is in contrast to the pending claims which recites an "idle sub-carrier frequency band" and which defines that the "idle sub-carrier frequency band includes only noise and interference" void of a signal component.

Thus, for the reasons stated above, Narasimhan fails to teach the elements of the claims and no *prima face* case of anticipation can be supported. And, withdrawal of the 35 U.S.C. 102 rejection is respectfully requested.

35 U.S.C. 103 Rejection

Dependent claim 9 was rejected under 35 U.S.C. 103(a) as being unpatentable over Narasimhan (US 7,016,651) in view of Vella-Coleiro (US 7,197,085). Dependent claim 10 was rejected under 35 U.S.C. 103(a) as being unpatentable over Narasimhan (US 7,016,651) in view of Jones et al. (US 6,757,241). Dependent claim 11 was rejected under 35 U.S.C. 103(a) as being unpatentable over Narasimhan (US 7,016,651) in view of Crawford (US 6,549,561).

The MPEP recited the standard to be applied in an issue of obviousness under 35 USC 103. Section 2143.03 of the MPEP states in part:

ALL CLAIM LIMITATIONS MUST BE CONSIDERED

"All words in a claim must be considered in judging the patentability of that claim against the prior art." *In re Wilson*, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

The factual inquiries that are relevant in the determination of obviousness are determining the scope and contents of the prior art, ascertaining the differences between the prior art and the claims in issue, resolving the level of ordinary skill in the art, and evaluating evidence of secondary consideration. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 2007 U.S. LEXIS 4745, at **4-5 (2007) (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). To establish a *prima facie* case of obviousness, the prior art references "must teach or suggest all the claim limitations." M.P.E.P. § 2142. Moreover, the analysis in support of an obviousness rejection "should be made explicit." *KSR*, 2007 U.S. LEXIS 4745, at **37. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *Id.* (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

Dependent claims 9, 10 and 11 each depend from independent claim 1, and as such, each also recites the elements of claim 1. The cited secondary references (Vella-Coleiro, Jones and Crawford), however, do not make up for the deficiency of Narasimhan. Instead, Vella-Coleiro is cited for teaching "determining a sum of a square of a quadrature signal component with a square of an in-phase signal component." See Office Action, page 8. Jones is cited for teaching "determining if the unassigned sub-carrier frequency band comprises a

system wide unassigned sub-carrier frequency band; storing the detected received power as a noise plus interference estimate if the sub-carrier frequency band does not comprise the system wide unassigned frequency band; and storing the detected received power as a noise floor estimate if the sub-carrier frequency band comprises the system wide unassigned frequency band.” See Office Action, page 9. And, Crawford is cited for teaching “synchronizing a time reference with a transmitter transmitting the OFDM symbols.” See Office Action, page 10.

Thus, the cited secondary references, either taken separately or in combination, do not disclose, teach or suggest all of the features of dependent claims 9, 10 and 11, and the 103 rejection should be withdrawn accordingly.

CONCLUSION

For the reasons stated above, the prior art references cited by the Examiner do not anticipate or teach, suggest or make obvious the pending claims 1 and 3-27. Thus, Applicants respectfully request withdrawal of the 35 U.S.C. 102 and 35 U.S.C.103 rejections based thereon.

REQUEST FOR ALLOWANCE

In view of the foregoing, Applicants submit that all pending claims in the application are patentable. Accordingly, reconsideration and allowance of this application are earnestly solicited. The Commissioner is authorized to charge Deposit Account No. 17-0026 for the fees owed for the Petition for Extension of Time. Applicants do not believe that any other fees are due regarding this amendment.

Attorney Docket No. 030226
Customer No. 23,696

16

However, if any other fees are required, please charge Deposit Account No. 17-0026.

Applicants encourage the Examiner to telephone the Applicants' attorney should any issues remain.

Respectfully submitted,

Dated: May 13, 2009

By: 

Jeff Jacobs, Reg. No. 40,029

QUALCOMM Incorporated
Attn: Patent Department
5775 Morehouse Drive
San Diego, California 92121-1714
Telephone: (858) 845-8279
Facsimile: (858) 658-2502